

NATURAL RESOURCES CONSERVATION SERVICE CONSERVATION PRACTICE STANDARD

DIVERSION

(Ft)
CODE 362

DEFINITION

A channel constructed across the slope with a supporting ridge on the lower side.

PURPOSE

This practice may be applied as part of a resource management system to support one or more of the following purposes.

- Break up concentrations of water on long slopes, on undulating land surfaces, and on land that is generally considered too flat or irregular for terracing.
- Divert water away from farmsteads, agricultural waste systems, and other improvements.
- Collect or direct water for water-spreading or water-harvesting systems.
- Increase or decrease the drainage area above ponds.
- Protect terrace systems by diverting water from the top terrace where topography, land use, or land ownership prevents terracing the land above.
- Intercept surface and shallow subsurface flow.
- Reduce runoff damages from upland runoff.
- Reduce erosion and runoff on urban or developing areas and at construction or mining sites.
- Divert water away from active gullies or critically eroding areas.
- Supplement water management on conservation cropping or stripcropping systems.

CONDITIONS WHERE PRACTICE APPLIES

This applies to all cropland and other land uses where surface runoff water control and/or management is needed. It also applies where soils and topography are such that the diversion can be constructed and a suitable outlet is available or can be provided.

CRITERIA

Capacity. Diversions as temporary measures, with a life span of less than 2 years, shall have a minimum capacity for the peak discharge from a 2-year, 24 hour-duration storm.

Diversions that protect agricultural land and those that are part of a pollution abatement system must have the capacity to carry the peak runoff from a 10-year-frequency, 24-hour-duration storm as a minimum.

Diversions designed to protect areas such as urban areas, buildings, and roads, shall have enough capacity to carry the peak runoff expected from a storm frequency consistent with the hazard involved but not less than a 25-year-frequency, 24-hour-duration storm with a freeboard not less than 0.3 ft.

Diversions that are part of a waste management system must have the capacity to carry the peak runoff from a 25-year frequency, 24-hour duration storm as a minimum. Refer to Section 29(b)(i), Chapter XI, Wyoming Water Quality Rules and Regulations for additional design requirements for diversions that are part of a waste management system.

Cross section. The channel may be parabolic, V-shaped, or trapezoidal. The diversion shall be designed to have stable side slopes. The ridge shall have a minimum top width of 4 ft at the design elevation. The ridge height shall include an adequate settlement factor.

The minimum cross section shall meet the specified dimensions. The top of the constructed ridge shall not be lower at any point than the design elevation plus the specified overfill for settlement.

Grade and velocity. Channel grades may be uniform or variable. Channel velocity shall not exceed that considered nonerosive for the soil and planned vegetation or lining.

Location. Outlet conditions, topography, land use, cultural operations, and soil type shall determine the location of the diversion.

Protection against sedimentation.

Diversions should not be used below high-sediment-producing areas unless land treatment practices or structural measures, designed to prevent damaging accumulations of sediment in the channels, are installed with or before the diversions. If movement of sediment into the channel is a significant problem, a vegetated filter strip shall be used where soil or climate does not preclude its use. Then, the design shall include extra capacity for sediment and be supported by supplemental structures, cultural or tillage practices, or special maintenance measures.

Outlets. Each diversion must have a safe and stable outlet with adequate capacity. The outlet may be a grassed waterway, a vegetated or paved area, a grade stabilization structure, an underground outlet, a stable watercourse, a sediment basin, or a combination of these practices. The outlet must convey runoff to a point where outflow will not cause damage. Vegetative outlets shall be installed before diversion construction to insure establishment of vegetative cover in the outlet channel. Underground outlets consist of an inlet and underground conduit. The release rate when combined with storage is to be such that the design storm will not overtop the diversion ridge. On large watersheds, runoff flows are usually too large to outlet entirely through underground outlets.

The design elevation of the water surface in the diversion shall not be lower than the design elevation of the water surface in the outlet at their junction when both are operating at design flow.

Vegetation. Disturbed areas that are not to be cultivated shall be established to grass as soon as practicable after construction. Seedbed preparation, seeding, fertilizing, and

mulching shall comply with standards in local technical guides. The vegetation shall be maintained and trees and shrubs controlled by hand, machine, or chemicals.

Lining. If the soils or climatic conditions preclude the use of vegetation for erosion protection, non-vegetative linings such as gravel, rock riprap, cellular block, or other approved manufactured lining systems may be used.

State regulations. A Wyoming Department of Environmental Quality/Water quality Division construction permit is required for diversions which are components of a waste management system.

CONSIDERATIONS

A diversion in a cultivated field must be aligned and spaced from other structures or practices to permit use of modern farming equipment.

Effects on the water budget, especially on volumes and rates of runoff, infiltration, evaporation, transpiration, deep percolation and ground water recharge.

The type of outlet, time of water detention, geology, and topography of the site.

Effects on erosion and the movement of sediment, pathogens, and soluble and sediment-attached substances carried by runoff.

Effects of nutrients and pesticides on surface and ground water quality.

Filtering effects of vegetation on movement of sediment and dissolved and sediment-attached substances.

Short-term and construction-related effects on the quality of downstream water.

Effects on the movement of dissolved substances below the root zone and toward the ground water.

Potential for uncovering or redistributing toxic materials and low productive soils that might cause undesirable effects on the water or plants.

PLANS AND SPECIFICATIONS

Plans and specifications for installing diversions shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose.

OPERATION AND MAINTENANCE

An operation and maintenance plan shall be prepared for use by the client. The plan shall include specific instructions for maintaining diversion capacity, storage, ridge height, and outlets.

The minimum requirements to be addressed in the operation and maintenance plan are:

- Provide periodic inspections, especially immediately following significant storms.
- Promptly repair or replace damaged components of the diversion as necessary.
- Maintain diversion capacity, ridge height, and outlet elevations especially if high sediment yielding areas are in the drainage area above the diversion. Establish necessary clean-out requirements.
- Each inlet for underground outlets must be kept clean and sediment buildup redistributed so that the inlet is at the lowest point. Inlets damaged by farm machinery must be replaced or repaired immediately.
- Redistribute sediment as necessary to maintain the capacity of the diversion.
- Vegetation shall be maintained and trees and brush controlled by hand, chemical and/or mechanical means.
- Keep machinery away from steep sloped ridges. Keep equipment operators informed of all potential hazards.